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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,945	09/29/2003	Jeongnam Youn	080398.P565	5303

7590 09/28/2006

Marina Portnova
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER	
HARPER, V PAUL	
ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/674,945	YOUN, JEONGNAM	
	Examiner	Art Unit	
	V. Paul Harper	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6,8,9,12-15,18,19,22,23 and 25* is/are rejected.

7)☒ Claim(s) *3-5,7,10,11,16,17,20,21 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the references listed in the Information Disclosure Statement dated 8/11/2006. A copy of the Information Disclosure Statement is attached to this office action.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-25 are drawn to an algorithm, per se, or program performing such or medium resulting from such. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are non-statutory. If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95,30 USPQZd at 1458-59. Thus, a process consisting solely of mathematical operations without some claimed practical application is drawn to non-statutory subject matter. In this case, the claims merely recite a step of "computing a plurality of individual scale factors ... in the encoded audio signal", without any practical application being recited (i.e., the results

are not tangible because they are not real-world results—the computation remains with the computer).

For the claimed process to be statutory it must indicate a practical appliation where, the claim must either: (A) result in a physical transformation outside the computer for which a practical application is either disclosed in the specification or would have been known to a skilled artisan (pre-computer or post-computer process activity), or (B) be limited to a practical application that produces a useful, concrete, and tangible result.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 6, 8, 9, 12-14, 15, 18, 19, 22, 23 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Lopez-Estrada et al. (U.S. Patent Application Publication US 2003/0083867), hereinafter referred to as Lopez-Estrada.

Regarding **claim 1**, Lopez-Estrada teaches a method for efficient rate control in audio encoding. Lopez-Estrada's teachings include the following:

- an initial common scale factor (Fig. 8, item 812; also Fig. 2, item 210, global_gain corresponds to common scale factor);
- computing an initial increment using the initial number of bits and a target number of bits (¶'s [0037]-[0046], in particular ¶[0042] and equation 16; also Fig. 2, item 225; Fig. 8, items 810 and 812);
- incrementing the initial common scale factor by the initial increment (Fig. 8, item 832 where initial values will be used for the initial increment; also Fig. 2, item 240);
- adjusting the incremented common scale factor based on the target number of bits (Fig. 8, ggn= (target-bits ....; also Fig. 2, loop to item 225);
- computing a plurality of individual scale factors based on an allowed distortion for an encoded audio signal, the individual scale factors controlling distortion in the encoded audio signal, wherein an initial value for each individual scale factor is equal to the adjusted common scale factor (Fig. 3, items 315, 320, 325, and 330, calculate and measure distortion, amplify band where the calculations of the rate control loop are shown in Fig. 8 and *ggn* is a function of the last global gain); and
- if a current number of bits associated with the plurality of individual scale factors exceeds the target number of bits, modifying the adjusted common scale factor until a resulting number of bits no longer exceeds the target number of bits (Fig. 8, items 818, 824; also Fig. 2, item 235).

Regarding **claim 2**, Lopez-Estrada teaches everything claimed, as applied above (see claim 1). In addition, Lopez-Estrada teaches "determining the initial common scale factor." (Fig. 8, items 810, 812; ¶'s [0062], also Fig. 2, item 210).

Regarding **claim 6**, Lopez-Estrada teaches everything claimed, as applied above (see claim 1). In addition, Lopez-Estrada teaches:

- quantizing spectral data within a frame using the incremented common scale factor (Fig. 8, items 814 and 820);
- determining that quantized spectral data is valid (Fig. 8, item 824);
- determining a current number of bits associated with the incremented common scale factor (Fig. 8, item 822);
- if the current number of bits exceeds the target number of bits, varying the incremented common scale factor in a decrease bit order (Fig. 8, item 824, No, then items 828 and 832); and
- if the current number of bits does not exceed the target number of bits, varying the incremented common scale factor in an increase bit order (Fig, 8, items 830 and 832).

Regarding **claim 8**, Lopez-Estrada teaches everything claimed, as applied above (see claim 1). In addition, Lopez-Estrada teaches "computing a plurality of individual scale factors comprises: iteratively adjusting each of the plurality of individual scale factors until an energy error associated with the adjusted each of the plurality of

individual scale factors is below the allowed distortion" (Fig. 3, items 315, 320, 326 and 330).

Regarding **claim 9**, Lopez-Estrada teaches everything claimed, as applied above (see claim 8). In addition, Lopez-Estrada teaches:

- incrementing each of the plurality of individual scale factors by a current increment (Fig. 3, item 330; ¶[0016] amplify the respective band by a predetermined factor);
- calculating an energy error associated with the incremented individual scale factor (Fig. 3, item 320, calculate the distortion);
- determining a type of the calculated energy error (¶[0016] distortion is compared to distortion criteria);
- setting the current increment to a first constant if the calculated energy error is of a first type; setting the current increment to a second constant if the calculated energy error is of a second type (Fig. 3, amplify or not depending upon relationship of distortion to criteria); and
- determining whether the calculated energy error is below the allowed distortion (Fig. 3, item 325).

Regarding **claim 12**, Lopez-Estrada teaches everything claimed, as applied above (see claim 1). In addition, Lopez-Estrada teaches:

- determining that the current number of bits associated with the plurality of individual scale factors exceeds the target number of bits (Fig. 8, items 818 and 824; also Fig. 2, item 235);
- adding an offset value to the adjusted common scale factor to compute a modified common scale factor (Fig, 8, item 832; also Fig. 2, item 240); and
- calculating the resulting number of bits associated with the plurality of individual scale factors and the modified common scale factor (Fig. 3, item 315, ... back to rate control loop, item 310).

Regarding **claim 13**, Lopez-Estrada teaches everything claimed, as applied above (see claim 12). In addition, Lopez-Estrada teaches "refraining from recomputing the plurality of individual scale factors when the adjusted common scale factor is modified" (Fig. 3, note the after step 310 [which includes adjustments to the global_gain] step 315 is performed [adjusting the scalefactors for the bands]).

Regarding **claim 14**, this claim has limitations similar to claim 1 and is rejected for the same reasons.

Regarding **claim 15**, this claim has limitations similar to claim 3 and is rejected for the same reasons.

Regarding **claim 18**, this claim has limitations similar to claim 1 and is rejected for the same reasons.

Regarding **claim 19**, this claim has limitations similar to claim 2 and is rejected for the same reasons.

Regarding **claim 22**, Lopez-Estrada teaches a method for efficient rate control in audio encoding. Lopez-Estrada's teachings include the following:

- a Huffman encoding module to determine an initial number of bits associated with an initial common scale factor (¶'s [0013] and [0015], Huffman encoder, Fig. 2, item 225; Fig. 8, items 816, 822).

The remaining limitations are similar to those found in claim 1 and are rejected for the same reasons.

Regarding **claim 23**, this claim has limitations similar to claim 2 and is rejected for the same reasons.

Regarding **claim 25**, this claim has limitations similar to claim 1 and is rejected for the same reasons.

Allowable Subject Matter

4. Claims 3-5, 7, 10, 11, 16,17, 20, 21 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable (assuming the 101 rejections given in ¶1 is overcome where applicable) if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 3, 16, 20, and 24, Lopez-Estrada teaches a method for efficient rate control in audio encoding, but Lopez-Estrada does not specifically teach that determining the initial common scale factor comprises selecting a spectral coefficient of a maximum value within a frame; if the maximum spectral coefficient is equal to zero, setting the initial common scale factor to 30; and if the maximum spectral coefficient is not equal to zero, setting the initial common scale factor to a prior common scale factor.

Regarding claim 5, Lopez-Estrada teaches a method for efficient rate control in audio encoding, but Lopez-Estrada does not specifically teach that the initial increment is computed using an expression *initial_increment=10*(initial bits-target bits)/target bits*, wherein *initial_increment* is the initial increment, *initial_bits* is the initial number of bits, and *target_bits* is the target number of bits.

Regarding claim 7, Lopez-Estrada teaches a method for efficient rate control in audio encoding, but Lopez-Estrada does not specifically teach that the incremented common scale factor is varied until a current increment is equal to zero.

Regarding claim 10, Lopez-Estrada teaches a method for efficient rate control in audio encoding, but Lopez-Estrada does not specifically teach the indicated use of the equations as stated in claim 12.

Response to Arguments

5. Applicant's arguments filed 8/11/2006 have been fully considered but they are not persuasive.

Regarding the 101 rejections of claims 1-21 (see current rejections) the claims do not describe practical application because the results are not tangible (i.e. they do not produce real-world results). In these cases, nothing leaves the processor. Scale factors are computed based on an allowed distorting in the encoded audio signal, but no real-world results are claimed.

6. Applicant asserts on page 10:

> Lopez-Estrada discloses encoding MPEG layer 3 (also known as MP3) audio, using an inner "rate" loop and an outer "distortion control" loop. Lopez-Estrada states that both loops are in accordance with the ISO/IEC specification, i.e., the MPEG layer 3 standard as referred to in paragraph 2 of Lopez-Estrada's specification. Applicant is submitting herewith An Introduction to MPEG Layer 3 by Karlheinz Brandenburg and Harald Popp. Applicant directs the Examiner attention to page 8, which describes the inner rate and outer noise control loops defined by the MPEG standard.

Paragraph 2 of Lopez-Estrada is part of the background description for the invention not Lopez-Estrada's claimed invention. An embodiment for Lopez-Estra's rate control process is illustrated in Fig. 8, which is clearly different from that shown in Fig. 2, which is according to the ISO/IEC standard.

7. Applicant asserts on page 11:

> The Examiner is equating Applicant's claimed computing of individual scale factors with Lopez-Estrada's outer distortion control loop. However, as specified by the MPEG standard, the outer noise, i.e., distortion, control loop uses 1.0 as the default starting value for each scale factor Brandenburg: page 8, lines 27-28). In amended claims 1, 14, 18 and 25, Applicant claims computing individual scale factors using the adjusted common scale value as the initial value for each individual scale factor. Because Lopez-Estrada does not teach or suggest using a different initial value than the value secified by the MPEG standard, i.e., 1.0, Lopez-Estrada's outer distortion control loop cannot be properly interpreted as equivalent to computing individual scale factors as claimed by Applicant.

It is noted that the results of the rate control process (Fig. 8) would enter Fig. 3 at item 310, and that there is not teaching that starting value for each scale factor is 1.0 (compare Fig. 2 with Fig. 8 and note that in step 812 the valued used is the last *global_gain*)

Citation of Pertinent Art

8. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

- Jang et al. (US Patent Application Publication 2004/0162720) teach method of audio encoding where a quantization noise curve adjuster adjusts a common gain to meet a target bit rate (abstract).
- Nishio et al. (US Patent Application Publication) teach an encoding method where common scale factors are calculated and adjusted according the number of bits used (Fig. 4, items S91, S92, S93).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Paul Harper whose telephone number is (571) 272-7605. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3/29/2006

V. Paul Harper
Patent Examiner
Art Unit 2626

V Paul Harper